

Northern Marianas College

CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2011

Type of Action:

- ☐ New
- ☒ Modification
- ☐ Move to Inactive (Stop Out)
- ☐ Cancellation

Course Alpha and Number: BI 225

Course Title: Basic Microbiology

Reason for initiating, revising, or canceling:

This course guide has been updated to reflect changes in textbooks, curriculum content, laboratory procedures, teaching methods, student learning outcomes, and course objectives.


Florita C. Cabanes

2-6-2012

Proposer

Date


Alfredo B. De Torres, Ph.D.

2-6-2012

Department Chair

Date


Barbara K. Merfalen

2-6-12

Dean of Academic Programs and Services

Date

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

1. Department

Sciences, Mathematics, Health, and Athletics

2. Purpose

This course will provide the students an understanding of the importance of microorganisms to mankind or the importance of microbiology to society in general, and a concern towards good hygiene, sanitary food preparation and clean environment. The principles learned in this course are relevant in understanding the disease process and control of microorganisms.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required Textbook:

Lecture:

Nester, E., Anderson, D., Roberts, E. Jr., & Nester, M. (2009).

Microbiology: A human perspective (6th ed.).

New York: McGraw-Hill Companies, Inc.

Laboratory:

Kleyn, J., Bicknell, M. (2007). *Microbiology Experiments: A Health Science Perspective* (6th ed.).

New York: McGraw-Hill Companies, Inc..

Readability level: Grade 13

B. Contact Hours

1. **Lecture:** 3 hours per week / 48 hours per semester

2. **Lab:** 3 hours per week / 48 hours per semester

3. **Other:** None

C. Credits

1. **Number:** 4

2. **Type:** Regular degree credits

D. Catalogue Course Description

This is a survey course covering the major groups of microorganisms in relation to their classification, characteristics, and medical importance; and introduces students to related topics in immunology and epidemiology. It is intended for students entering the fields of professional health care, although other students may wish to enroll in the course. Laboratory and field trips are required.

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

Prerequisite: A "C" grade or higher in BI 101. English Placement Level: EN 101. Math Placement Level: MA 132. (Offered Fall and Spring)

E. Degree or Certificate Requirements Met by Course

A "C" grade or higher in this course satisfies:

1. An NMC General Education requirement for biological science course with a lab.
2. An elective course requirement.
3. A requirement for the Nursing Degree Program.

F. Course Activities and Design

This course includes pretest and posttest, lectures, group work, discussions, laboratory activities, homework and web-based assignments, viewing audio-visual materials, powerpoint presentations, periodic quizzes, tests, and comprehensive final exam, fieldtrip, and research projects that require presentations.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)

Prerequisite: "C" grade or higher in BI 101
English Placement Level: EN 101
Math Placement Level: MA 132

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 4-credit course, cost of textbooks, laboratory fee, research activities expenses, and instructional materials fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include classroom and laboratory space; whiteboard and pen; TV/VCR; Smart Board; audio-visual programs/software; transparency and multimedia projectors; and various laboratory materials, chemicals, equipments and facilities.

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

6. Method of Evaluation

Student grades will be based on the regular letter grade system as described below:

- A: Excellent – grade points: 4.0;
- B: Above average – grade points: 3.0;
- C: Average – grade points: 2.0;
- D: Below average – grade points: 1.0;
- F: Failure – grade points: 0.0.

NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Life and Death of Microorganisms

- 1.1 Humans and the Microbial World
- 1.2 Microscopy and Cell Structure
- 1.3 Dynamics of Prokaryotic Growth
- 1.4 Control of Microbial Growth

2.0 The Microbial World

- 2.1 Identification and Classification of Prokaryotic Organisms
- 2.2 The Diversity of Prokaryotic Organisms
- 2.3 The Eukaryotic Members of the Microbial World
- 2.4 Viruses, Prions, and Viroids: Infectious Agents of Animals and Plants

3.0 Microorganisms and Humans

- 3.1 The Innate Immune Response
- 3.2 The Adaptive Immune Response
- 3.3 Applications of Immune Response
- 3.4 Epidemiology

4.0 Infectious Diseases

- 4.1 Respiratory System Infections
- 4.2 Skin Infections
- 4.3 Wound Infections
- 4.4 Digestive System Infections
- 4.5 Genitourinary Tract Infections
- 4.6 Nervous System Infections
- 4.7 Blood and Lymphatic Infections

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

- 5.0 Applied Microbiology
 - 5.1 Microbial Ecology
 - 5.2 Environmental Microbiology
 - 5.3 Food Microbiology

8. Instructional Goals

This course will introduce students to:

- 1.0 Selected laboratory techniques in the study and identification of microbes;
- 2.0 The human perspective of the microbial world;
- 3.0 Different types of microscopes used in the observation of microorganisms;
- 4.0 Dynamics and control of the growth of microorganisms;
- 5.0 The identification and classification of organisms;
- 6.0 The diversity of prokaryotic organisms and eukaryotic members of the microbial world;
- 7.0 The infectious agents of animals and plants such as the viruses, prions, and viroids;
- 8.0 The innate and adaptive immune responses and their applications;
- 9.0 Concepts in Epidemiology;
- 10.0 Types of infectious diseases in the human body; and
- 11.0 Applications of microbiology in the field of ecology, in the study of food and in various environmental conditions.

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

9. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1.0 Discuss the history of microbiology and theories that explains the origins of microorganisms;
- 2.0 Compare the different methods in identification and classification of prokaryotes and the features that characterize viruses, prokaryotes, and eukaryotes;
- 3.0 Use the proper materials and method in the sampling, culture, isolation, observation, and identification of microorganisms;
- 4.0 Illustrate the structures of prokaryotic and eukaryotic cells and describe their functions;
- 5.0 Classify microbes according to their nutritional patterns;
- 6.0 Design an experiment that measures bacterial growth;
- 7.0 Employ physical and chemical methods of controlling microbial growth;
- 8.0 Describe the modes of action of different classes of chemotherapeutic agents and the development of drug resistance in microbes;
- 9.0 Explain how the immune system works, how antisera and vaccines are produced and the benefits and hazards of immunization;
- 10.0 Outline the principles in epidemiology that may be used in tracking the transmission and spread of a disease;
- 11.0 Describe methods by which diseases are spread and how to prevent their spread;
- 12.0 Identify important human pathogens and the diseases caused by them;
- 13.0 Use methods of preventing contamination of water and food;
- 14.0 Describe the importance of microbes in agriculture, food production, industry and the ecosystem; and
- 15.0 Evaluate student research results for the improvement of the quality of life.

Northern Marianas College

Course Guide

Course: BI 225 Basic Microbiology

10. **Assessment Measures**

Assessment of student learning may include, but not be limited to, the following:

- 1.0 Student learning will be reflected in the results of assignments, periodic quizzes, tests, comprehensive final exam, laboratory exercise reports, and fieldtrip reports.
- 2.0 A research project paper will demonstrate the student's ability to choose a useful microbiological issue and to apply the scientific method.